

AMENDMENTS TO THE CLAIMS

1 - 17 (canceled).

18. (Currently amended) A separator for electrochemical systems, comprising:

a first conductive plate having a face; and

a second conductive plate having a face;

wherein each plate includes a series of projections extending outwardly therefrom; wherein each of the projections have a corresponding cavity defined on the opposite side thereof;

wherein when the faces of the first and second plates are brought into an overlapping relationship, at least a subset of the cavities of the first plate engage a subset of the cavities of the second plate to provide at least one flow path between the first plate and the second plate;

wherein the cavities of the first plate are dissimilar in shape from the cavities of the second plate; and

wherein the projections on the first plate are discrete and spaced from one another.

19. (Canceled)

20. (Currently amended) The separator of claim [[19]] 18 wherein the cavities of the second plate comprise a plurality of generally parallel channels.

21. (Previously presented) The separator of claim 18 wherein the at least one flow path between the first plate and the second plate defines at least one flow path for cooling fluid.

22. (Previously presented) The separator of claim 18 wherein at least one of the projections of the first plate and the projections of the second plate define a flow path for media distribution.

23. (Previously presented) The separator of claim 22 wherein the projections of the first plate define a flow path for distributing a fuel medium on the anode side of a fuel cell.

24. (Currently amended) The separator of claim 22 wherein the projections of the second plate define a flow path for distributing a ~~media~~ medium on the cathode side of a fuel cell.

25. (Currently amended) The separator of claim 24 wherein the ~~media~~ medium is one of air and oxygen.

26. (Currently amended) A method of manufacturing a separator for electrochemical systems comprising:

providing a first conductive plate having a face and a second conductive plate having a face;

each plate including a series of projections extending outwardly therefrom, the projections on the first plate being discrete and spaced from one another;

each of the projections having a corresponding cavity defined on the opposite side thereof, the cavities of the first plate being dissimilar in shape from the cavities of the second plate;

bringing the first conductive plate and the second conductive plate into an overlapping relationship, engaging at least a subset of the cavities of the first plate with at least a subset of the cavities of the second plate, thereby providing at least one flow path between the first plate and the second plate; and

joining the first conductive plate and the second conductive plate.

27. (Canceled)

28. (Currently amended) The method of claim 26 wherein including the step of forming the cavities of at least one plate using at least one of the processes of roller embossing, punching, hydroforming and eddy current embossing.

29. (Previously presented) The method of claim 26 wherein the step of joining the first conductive plate and the second conductive plate is performed by one of soldering, bonding and laser welding.

30. (Currently amended) [[A]] An electrochemical system including:

a first fuel cell, a second fuel cell and a bipolar plate;

said bipolar plate being interposed between the first fuel cell and the second fuel cell;

the bipolar plate comprising:

a first conductive plate having a face; and

a second conductive plate having a face;

wherein each conductive plate includes a series of projections extending outwardly therefrom; wherein each of the projections have a corresponding cavity defined on the opposite side thereof; and wherein the cavities of the first plate are dissimilar in shape from the cavities of the second plate;

wherein when the faces of the first and second plates are brought into an overlapping relationship, at least a subset of the cavities of the first plate engage a subset of the cavities of the second plate to provide at least one flow path between the first plate and the second plate;

wherein the projections of the first plate are discrete and spaced from one another and define a flow path for distributing a fuel medium on the anode side of the first fuel cell; and

wherein the projections of the second plate define a flow path for distributing a medium on the cathode side of the second fuel cell.

31. (Previously presented) The electrochemical system of claim 30 wherein the electrochemical system is a polymer electrolyte membrane system.

32. (Previously presented) The electrochemical system of claim 30 wherein the second fuel cell is a self-breathing fuel cell.

33. (Currently amended) The process of using a separator in an electrochemical system including the steps of:

providing at least one separator having a first conductive plate having a face and a second conductive plate having a face;

each plate including a series of projections extending outwardly therefrom,
the projections of the first plate being discrete and spaced from one another;

each of the projections having a corresponding cavity defined on the
opposite side thereof, wherein the cavities of the first plate are dissimilar in shape
from the cavities of the second plate;

bringing the first conductive plate and the second conductive plate into an
overlapping relationship, engaging at least a subset of the cavities of the first plate with
at least a subset of the cavities of the second plate, thereby providing at least one flow
path between the first plate and the second plate; and

joining the first conductive plate and the second conductive plate;

installing the at least one separator in an electrochemical system; and

providing a media on a first side of the separator and providing a media on a
second side of the separator.

34. (Previously presented) The process of claim 33 wherein the electrochemical system is a fuel cell.

35. (Previously presented) The process of claim 34 wherein the fuel cell is a self breathing fuel cell.

36. (Previously presented) The process of claim 33 wherein the electrochemical system is an electrochemical processor.

37. (New) The separator of claim 18 wherein the first plate is in contact with and connected to the second plate.